

Research on the Economic Benefits of Geographic Coordinate Products' Live Streaming Sales' from the Perspective of Rural Revitalization

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Abstract: Geographic coordinate products play a key role in promoting regional economic development and increasing farmers' income, and are a decisive force in promoting rural revitalization and agricultural modernization. In order to further study the economic benefits of geographic coordinate products live streaming sales from the perspective of rural revitalization, this study used panel data models, survey questionnaires, interview methods, and comparative methods to measure the results. It was found that the economic benefits are mainly reflected in the following aspects. Firstly, the development of live streaming e-commerce industry can directly promote the development of geographic indication products and their upstream and downstream industrial chains, and promote agricultural modernization. In terms of ecological revitalization, it can promote the development of local tourism resources, protect natural landscapes, improve pollution management, enhance living environment, and play the ecological role of agriculture. Therefore, live streaming sales can provide a great driving force for the construction of socialist modernization, rural development, modernization of agriculture, comprehensive promotion of rural industry talent, cultural and ecological organization revitalization.

Keywords: Luochuan County, Geographic Coordinates Product, Economic Benefits, Midway Classification.

1. Introduction

In 2023, the Central Committee of the Communist Party of China and the State Council continued to emphasize the need to promote the high-quality development of rural industries in their opinions on the key work of comprehensively promoting rural revitalization in 2023 [16] We need to deeply implement the models of promoting agriculture through digital commerce and Internet plus+agricultural products going out of villages and into cities to encourage the development of e-commerce direct purchase and customized production of agricultural products. The construction of agricultural and sideline products e-commerce live broadcast base geographical coordinates of agricultural products has gradually become an important carrier for regional development of modern agriculture and featured agriculture because of its huge economic and cultural value [7] Provide the government with an understanding of rural development, formulate scientific and reasonable policies, and promote the upgrading and transformation of rural industries

Reviewing existing literature, this study mainly focuses on the following aspects: firstly, research on the development path of agricultural product e-commerce. Lu Zhengyi believes that the development of agricultural product e-commerce should fully draw on the development experience of developed countries and regions, based on local characteristics, and create brand effects. Gu Xudong believes that the development of agricultural products should increase investment in rural e-commerce and improve the supporting service system for rural e-commerce development. Secondly, related research on the impact of agricultural product e-commerce. He Yan believes that in the context of rural revitalization, live streaming sales of agricultural product e-commerce play a crucial role It not only opens up sales channels for farmers' agricultural products, but also greatly increases their income. This innovative sales method is

undoubtedly a powerful engine for promoting rural economic development. Huang Lu believes that live streaming of agricultural product e-commerce is a key measure to promote rural revitalization. It can not only help solve the problem of unsold agricultural products, but also strengthen the promotion of local industrial culture. More importantly, it creates more employment opportunities for rural areas, promotes the two-way flow of human and material resources between urban and rural areas, and brings tangible income growth to farmers Thirdly, research on geographical coordinates of agricultural products. Liu Li explored the role of geographical coordinates of agricultural products in promoting the economic development of Liaoning Province from the perspective of industrial agglomeration, and put forward corresponding suggestions for the protection and development of industrial clusters. He Lunfeng and Zeng Rui believe that rural e-commerce+geographical indication agricultural products is a new rural development model and is of great significance for rural revitalization and modern agricultural development. At the same time, due to local socio-economic and cultural differences, there are significant differences in the development and protection of geographical coordinates of agricultural products, especially in the extension of industrial chains and internationalization of industrial agglomeration. Therefore, it is necessary to systematically study the relationship between geographical coordinates of agricultural products and social and economic benefits in Shaanxi

2. Research Overview

Luochuan County, located in the gully area of Weibei Loess Plateau in the south of Yan'an City, covers a total area of 1804 square kilometers, flat land, wide texture, good sunshine, sufficient temperature difference between day and night, heavy rain, hot weather, and superior natural conditions in the same season. It is known as the hometown of warehouses and

apples in northern Shaanxi. It is said that in 2021, the registered residence population of the county will be 220800, and the agricultural population will be 161000. It has unique advantages to develop agriculture. Luochuan Apple's trademark was announced in 2008 and recognized as China's famous trademark in 2010. On January 10, 2020, Luochuan Apple ranked among China's farmers with a brand valuation of 68.727 billion yuan

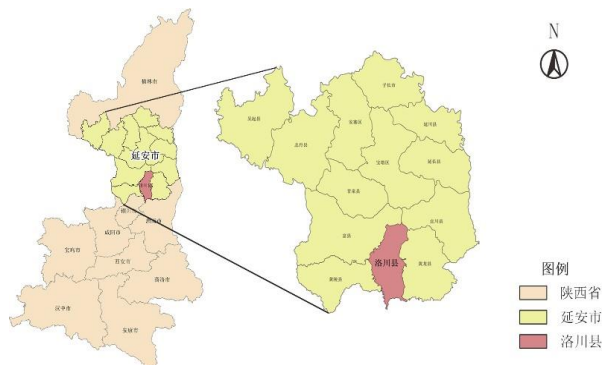


Figure 1. The location of Luochuan County

In 2013, the government of Luochuan County identified Luochuan apples as the main brand to develop the local e-commerce industry. In 2014, the e-commerce industry officially took shape. Currently, Luochuan County has developed more than 8000 e-commerce enterprise online stores, with annual sales exceeding 1.25 billion yuan and driving an annual income increase of 400 million yuan for the masses. Luochuan County has been identified by the Ministry of Commerce as a comprehensive demonstration county for e-commerce entering rural areas

In recent years, Luochuan County has vigorously implemented industrial transformation. Apple has led the county town to expand south, revitalize the countryside, lay the foundation for education, and put the economy and society on the track of high-quality development. Through Internet plus, helping rural revitalization is representative and typical in the practice of rural revitalization in all counties, towns and villages, especially in areas with local agricultural products

3. Research Method

3.1. Panel Data Modeling Method

Construct a panel data model by using the area and output of geographical indication agricultural products, as well as other rural economic input factors such as fertilizer, fiscal expenditure, electricity consumption, etc., as explanatory variables, and agricultural production value, per capita

disposable income of farmers, and other rural development indicators as dependent variables. If the impact coefficient of geographical indication agricultural products on rural development indicators increases after 2014, it indicates that the changes that occur at this node have significantly contributed to the economic spillover benefits of geographical indication agricultural products. This has led to more significant positive effects on the enhancement of the primary industry, the improvement of farmers' poverty alleviation and wealth creation living standards, and the promotion of technological innovation in the development process of geographical indication agricultural products

Its econometric model is

$$\ln GOV = \beta_0 + a_1 \ln Land + a_2 \ln GIs + a_3 \ln Additive + a_4 \ln Invest + a_5 \ln Power + \mu \quad (1)$$

$$\ln FPI = \beta_0 + a_1 \ln Land + a_2 \ln GIs + a_3 \ln Additive + a_4 \ln Invest + a_5 \ln Power + \mu \quad (2)$$

Establish an empirical model based on the total sowing area of apples, apple yield, agricultural fertilizer application, agricultural and forestry water affairs expenses, and rural electricity consumption. If the fitting coefficient a_i in the model is regular, it is positively correlated with the dependent variable. If a_i is negative, it is negatively correlated. The absolute value of a_i represents the degree of influence of the explanatory variable on the results

3.2. Survey Questionnaire Method

In order to better understand market demand and consumer preferences, this survey conducted a survey on the consumer group's perception, purchasing behavior, and evaluation of Luochuan apples through questionnaires, providing reference for the sales situation of Luochuan apples. At the same time, on-site interviews were conducted with each e-commerce entrepreneur for 20-25 minutes. The interviews were recorded and the data was organized with the consent of the interviewees. In addition, informal conversations between Asi Village and villagers were conducted to understand the planting and sales of apples in Luochuan, in order to supplement the shortcomings in the research

4. Data Sources

4.1. Collecting Data

Mainly from the Yan'an Statistical Yearbook released by the Yan'an Municipal Bureau of Statistics from 2007 to 2021, the relevant parts related to Luochuan County were selected and cross checked before being put into use.

Table 1. Detailed data collection from 2007 to 2021

Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Gross product of primary industry	8.80	10.88	11.49	14.80	19.27	20.44	22.47	24.03	20.96	22.89	23.11	18.39	24.06	34.04	36.56
Apple yield	560116	600113	685000	676500	745000	750012	763500	793000	801000	864700	888479	894552.5	900626	924445	984954
Apple orchard area	33618	33619	33564.8	33592.93	33702.93	33727	33858	33889	34274.53	34274.53	35088.87	35593.47	35515.2	35761.8	35651.87
Expenditures for agriculture, forestry and water conservancy	6857.00	12443.00	13037.00	18885.00	23019.00	24963.00	33200	37000	37100	31200	37440.00	48010.00	42800	36200	30200
Amount of agricultural chemical fertilizer applied	14413.00	23783.00	33262.00	36703.00	38187.00	53527.00	56489.00	61468.00	58261.00	59092.00	59923.00	58353.00	52518.00	56301.00	52841.00
Electricity for rural use	2443.00	6884.00	6218.80	6662.40	6851.50	6526.75	6202.00	6202.00	7785.00	6677.00	7353.00	7104.00	7440.00	7851.00	8329.00
Per capita disposable income of rural residents	4020.27	4500.14	5301.00	6352.00	7978.00	9278.00	10400	11742.00	12987.00	11713.00	12786.00	12027.00	13249.00	14356.00	36548.00

4.2. Questionnaire Investigation

From September 29th to October 4th, 2023, 100 questionnaires were distributed at various apple production bases and live streaming sales workshops in Luochuan County, and a total of 100 valid questionnaires were collected

The 92 questionnaires are divided into three parts. The first part is the basic information of consumers, including gender, age, income, place of residence, etc., to establish a basic image of the surveyed objects and enhance the practicality of the data. The second part is the situation of consumers purchasing apples, including their opinions on apples, their

understanding of Luochuan apples, their purchasing tendencies and channels, etc., to obtain the progress of Luochuan apple sales and promotion work. The third part is the evaluation and experience of consumers towards Luochuan apples. This article uses a matrix scale to evaluate consumers' purchasing and consumption experience. The NPS scale is used to evaluate consumers' likelihood of purchasing Luochuan apples again and recommending them to others, in order to understand consumers' subjective evaluation. This provides a basis for summarizing the advantages and disadvantages as well as the construction results of geographical coordinates.

Table 2. Summary of the basic information of the surveyed consumers

Feature	Category	N	Ratio	Feature	Category	N	Ratio
Gender	Male	26	28.26	Place of Residence	Chinese mainland	92	0
	Female	66	71.74		Hong Kong, Macao and Taiwan	0	0
Age	Under 18 (not included)	7	7.61		Overseas	0	0
	18 - 25	73	79.35		First-tier City	6	6.52
	26 - 35	2	2.17	New First-tier City	39	42.39	
	36 - 50	9	9.78	Capital city or other developed cities in the same province	11	11.96	
	Above 50 (not included)	1	1.09	Small and medium-sized cities or developed county-level cities	5	5.43	
Monthly income	¥2000 and below	74	80.43	County	16	17.39	
	¥2000 - 5000	8	8.7	Rural	15	16.3	
	¥5000 - 8000	8	8.7	I don't know exactly	0	0	
	¥8000 - 12000	2	2.17				
	¥12000 and above	0	0				

The majority of female consumers in this questionnaire are under the age of 25, accounting for more than 80%, and women account for about 71.74%. At the same time, from the perspective of monthly income, most of the respondents have low income of 2000 yuan or less, accounting for about 80.43%. None of the 92 respondents have more than 12000 yuan, and all of them live in Chinese Mainland. Among them, the number of residents in new tier cities accounts for about 42.39%, followed by counties and towns accounting for about 17.39% and 16.3% respectively

5. Economic Benefit Research

Before live streaming sales, Luochuan apples were trapped in unsold difficulties due to poor geographical conditions, poor information flow, low exposure rates, and other factors. Fruit prices fell sharply, and economic benefits declined. Against the backdrop of digital economy promoting rural revitalization, the Luochuan County Government signed a cooperation agreement with Alibaba Rural Taobao, creating

the Luochuan apple model, which includes consumer side reverse engineering, standardized production variety improvement, refrigerated cold chain, graded sorting, establishing sales standards, building direct warehouses, combined marketing, cultivating brands, and cultivating e-commerce talents. As shown in Table 3, although the apple industry in Luochuan had already taken shape before 2014, the impact coefficients of apple planting area and yield on GOV and FPI were only 0.201, 0.223, and 0.714, respectively. From 2014 onwards, the impact of apple production and planting area on the gross domestic product of the primary industry and per capita disposable income of rural residents in Luochuan County has significantly increased, which is basically consistent with the time node of Luochuan County's comprehensive integration with e-commerce. These two coefficients jumped to 1.791, 2.106, and 0.987, 2.129, indicating that the development of e-commerce has a significant impact on the economic spillover benefits of Luochuan apples. The apple industry occupies a more prominent position in the agricultural development of Luochuan County.

Table 3. Results of economic benefit measurement model of geographical indication products in Luochuan

Factor	2007 - 2013		2014 - 2021	
	GOV	FPI	GOV	FPI
Land	0.201**	0.223*	1.791***	2.106**
GIs	0.714**	0.453***	0.987*	2.129**
Additive	0.125*	0.418***	-0.202	-0.096*
Invest	-0.026	-0.006	-1.288	0.549*
Power	-0.013*	-0.105*	-0.205	0.997***

Note: ***, ** and * represent significance levels of 1%, 5% and 10% respectively

5.1. Increased Visibility

In order to increase the influence of Luochuan Apple, the county government actively cooperates with short video We media platforms such as Tiktok Kwai, making Tiktok Apple a hot topic, injecting new vitality into the e-commerce publicity of Luochuan [12]. Every year, Luochuan County holds a grand apple festival and has also co-organized a series of promotional activities such as the Agricultural Investment Cup, the first Yan'an Apple Luochuan Apple Brand Promotion Short Video Competition in Yan'an City, and the Luochuan Apple China Red Short Video Competition. Leveraging the influence of internet experts, the county has continuously enhanced the brand influence of Luochuan apples by promoting special cooperative and limited edition products. In February 2022, Luochuan apples achieved a new breakthrough in the international market. 13.7 tons of Luochuan apples, which had undergone strict customs inspection, were successfully exported from Qingdao Port to Canada. This breakthrough opened a new door for Luochuan apples to enter the international high-end market. According to the preliminary questionnaire results, 23.59% of the 200 respondents who knew about Luochuan apples were from Taobao, JD.com, and other sources. Recommended by e-commerce platforms such as Pinduoduo to learn about Luo. Another 21% of Sichuan Apple people learned about it through the promotion of short video platforms such as Tiktok Kwai, and because some consumers are worried about not being able to purchase authentic Luochuan Apple, they prefer to purchase it on short video e-commerce platforms such as

Tiktok Mall or in the live broadcast room of the anchor with goods

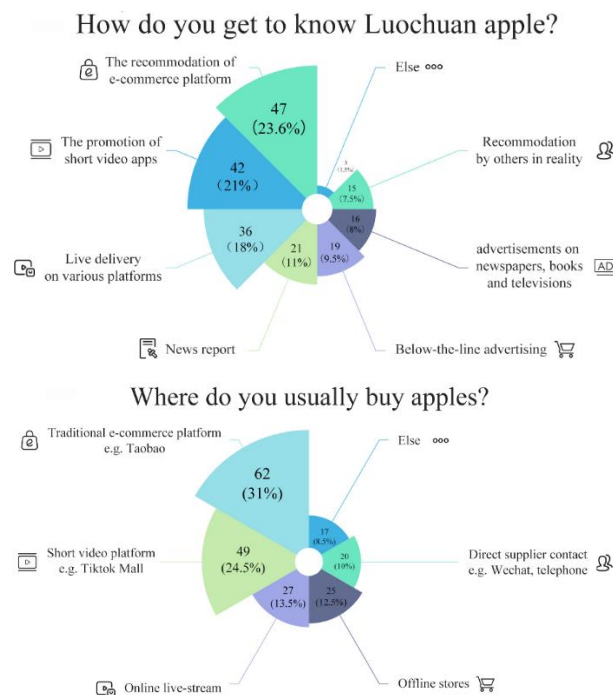


Figure 2. Summary table of partial information of questionnaire survey

5.2. Promote Technological Updates

At the production workshop of Top Fruit Industry Co., Ltd. in Luochuan County, team members witnessed the entire process of the intelligent fruit selection line using X-rays to perform physical examinations on apples. The system will take 40 photos from multiple angles to detect indicators such as scar, mold, heart, luster, sugar and acid content of apples and using a fully automatic weighing and sensing system for intelligent grading to ensure the integrity of each apple's skin, uniform size, and high-quality appearance and taste. Zhao Fengfeng, the person in charge of the enterprise, said that in the past, consumers were attracted by the brightly colored appearance in videos and found that the fruit was actually moldy fruit. This experience undoubtedly dealt a serious blow to the brand image. In order to completely solve this problem, we introduced this intelligent fruit selection line to ensure that every apple can trace its origin, and through digital technology, the apples are accurately graded and priced to achieve a premium value-added effect. This improvement has increased the average selling price of apples by 0.5 to 1.2 yuan per kilogram, bringing up to 480 million yuan in income for fruit farmers

In order to enable consumers to taste the deliciousness of Luochuan apples throughout the four seasons, the Luochuan County government has created a cold storage chain that directly builds fruit warehouses in orchards, providing great convenience for fruit farmers. They can easily store apples in nearby cold storages to achieve staggered sales. Currently, the county has developed 203 cold storages with apple refrigeration capacity of up to 683000 tons, and the warehousing industry has become an emerging industry. Our company's cold storage chain is not only for personal use, but also rented out to surrounding fruit farmers to achieve the goal of selling Luochuan apples from one season to four seasons. The project manager of Luochuan Hongbao Fruit Refrigeration Co., Ltd., Nan Wuchao, showed us the

company's cold storage chain.

5.3. Promote Farmers' Income Increase

Take TikTok as an example. According to the data of Daduoduo, the number of farmer anchors has reached more than 10,000 they have succeeded in bringing goods through live broadcast

More than 5 million agricultural products were sold, with a growth rate of 88% compared to 2020. The increased sales of agricultural products directly affect the personal income of farmers, which not only greatly increases their income but also lays a solid foundation for the rural revitalization strategy. In 2018, the per capita disposable income of farmers was 12027 yuan, and in 2022, it was 16835 yuan. The average growth rate reached 28.5%, highlighting the significant improvement in farmers' living standards

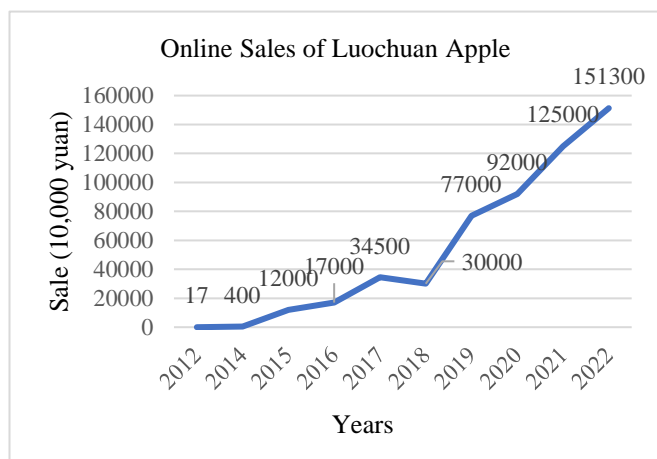


Figure 3. Online Sales of Luochuan Apple

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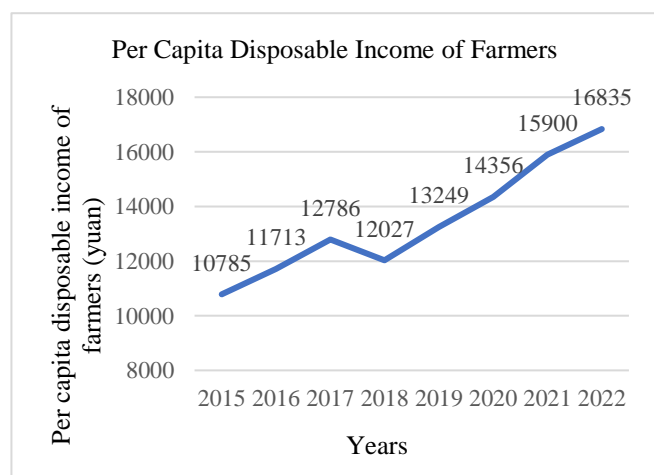


Figure 4. Per Capita Disposable Income of Farmers

6. Social Benefit Analysis

6.1. Industrial Revitalization

In order to accelerate the improvement of e-commerce infrastructure, carefully polish and optimize every link of the supply chain to ensure the stable development of the e-commerce industry, the government of Luochuan County has established a fully functional and first-class e-commerce incubation center. During field research, we conducted in-depth research on the operation mode of the e-commerce innovation and entrepreneurship park and found that they have implemented a rent discount policy of two exemptions and one halving to attract more enterprises to settle in. These measures not only enhance the comprehensive strength of the e-commerce industry, but also inject new vitality into its high-quality development

6.2. Ecological Revitalization

Built a tourism complex integrating picking, tourism, exhibition, farmhouse catering, and accommodation, created an apple culture tourism park, designed apple themed catering, excavated and packaged Luochuan cuisine culture, and added the apple cultural characteristics of Luochuan tourism

7. Conclusion and Discussion

At the forefront of the emergence of agricultural product e-commerce, sales face many challenges such as narrow radiation range, weak influence, and difficulty in forming economies of scale. In the initial stage of agricultural product e-commerce, due to the imperfect logistics system, insufficient supervision, and limited shelf life of agricultural products, the agricultural digital economy is also affected.

The promotion of e-commerce in Luochuan has encountered significant obstacles. According to the results of this study, the continuous growth of e-commerce sales in Luochuan has shown a good development trend. Rural e-commerce has broken through traditional geographical limitations, promoted agricultural products to a wider market, expanded sales channels, increased market size, improved farmers' sales income, and also increased the visibility of agricultural products in corresponding geographical coordinates. At the same time, rural e-commerce platforms provide online transaction methods, saving time and transportation costs, reducing intermediate links in the transaction process, and making agricultural product prices more reasonable. In terms of social benefits, with the rise of live streaming e-commerce, more and more young people are joining the rural e-commerce field, injecting new vitality into this industry. Their joining not only improves the overall quality of rural e-commerce practitioners, but also enhances the strength and competitiveness of the entire industry. Luochuan County uses e-commerce skills training to attract young rural farmers to stay online in the countryside and become local experts in apple online sales, such as Tian Xiucai

Moreover, live streaming is a great promotional tool that can bring new impetus to local tourism development. During the live streaming process, farmers can introduce the characteristics and advantages of agricultural products, allowing consumers to better understand them. At the same time, farmers can also showcase local tourist attractions and resources, allowing consumers to better experience the local culture and history

However, in order to continuously promote the prosperity and development of rural e-commerce, it is crucial to strengthen market supervision of agricultural products. The quality and safety of agricultural products are directly related to the health and safety of consumers. Therefore, in the development process of rural e-commerce, we must attach great importance to market supervision of agricultural products, strictly control the quality and safety of agricultural products, enhance consumers' trust in e-commerce, and promote the formation of consumer behavior. Specifically, it is necessary to supervise the entire process of agricultural products from production, circulation, sales to consumption. Firstly, establish and improve the management system of agricultural product quality and safety, continuously optimize the mechanism of agricultural product quality testing and certification, and ensure that the quality and safety of agricultural products meet the standards. Secondly, increase the supervision of rural e-commerce platforms, resolutely crack down on illegal activities such as counterfeiting, false advertising, price fraud, etc., maintain market order and consumption Consumer Rights [5].

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Reference

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